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Research Notes : Exotic soybean observational yield performance trial in Kien Gian province --Mekong Delta --Vietnam --dry season 1981-1982

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1) Decapitation technique to increase grain yield in soybean

In soybean, pod clusters were generally formed at the nodes of stem and/or at those of branch, but at the higher nodes, pod clusters failed to develop sufficiently, pods and seeds seemed to be smaller and empty (unfilled). Then, if we can control its branching capability, and cause branching earlier and more numerous to bring out more flower and pod clusters at the nodes of mid-stem and those of mid-branch, it will be sure that flowering and/or pod formation occur at short interval of time and be numerous. In spring, soybean grown in well-amended soil, if subjected to decapitation technique when having 4-5 trifoliate leaves, will begin branching earlier, branches may develop well and grain yield increases steadily. It is recommendable to use decapitation technique in soybean having 7-8 trifoliate leaves in summer. When subjected to decapitation technique, soybeans flower 4-5 days earlier and interval of time of flowering is shorter. This gives more horizontal branches exposed to more sunlight; thus, soybeans may produce more filled pods and harvest can be done earlier because soybean matures more uniformly. Let us use decapitation technique in soybean at proper time; if earlier, plants are still weak and if later, branching becomes more numerous and then there is no action at all. When this decapitation technique is applied on a commercial scale, grain yields may differ from 14% to 22% when soybean is grown at proper time.

Table 1. Interaction of decapitation technique versus number of flowers, number of pods, pod weight and seed weight in spring soybean

Treatment	No. of flowers	No. of pods (%)	Pod weight (%)	Seed weight (%)
Without decapitation	88	100	100	100
With decapitation	123	130	130	130

*Removed a terminal internode and uppermost leaf when having 5 trifoliate leaves.

**Flowering occurred at 76-80 days after sowing.

Table 2. Interaction of decapitation technique versus total length of branches per plant, leaf number per plant, number of flowers per plant and grain yield

Treatment stage	Total length of branches/ plant (cm)	No. of leaves per plant	No. of flowers per plant	Yield index (%)
5-leaf	129	65	359	82
6-leaf	---	---	---	---
7-leaf	191	109	460	154
8-leaf	---	---	---	---
9-leaf	179	87	438	142
Without decapitation	168	81	407	100

NB. 1) Total length of branches is measured at 70 days after sowing

2) Number of leaves and number of flowers are counted at 80 days after sowing.

--- Data not computed.

Chu Huu Tin

2) Nontillage is a technique in growing soybean (*Glycine max* (L.) Merrill)

Of course, the best type of soil for growing soybean (*Glycine max* (L.) Merrill) is a light textured soil, rich in humus, and its acidity is around neutral (not acid). Such a soil may be neither influenced by saline water nor under flooded condition. But in South Vietnam, especially in the Mekong Delta and in favorable weather conditions, soybean is able to grow and develop well and give a high seed yield on relatively heavy clay with pH over 4.5 There, soybean can be grown without land tillage; this has been clarified by experimental data in commercial scale.

This technique of nontillage is successfully applied both in sandy soil of island and in rice farmer field rich in humus.

The fact that soybean can be grown without land tillage on a variety of light textured soil as mentioned above is apparently accepted but there is also doubts for the feasibility of growing soybean in rice farmer field, of which, soil is quite heavy and more or less affected by ions Al^{+++} and/or Fe^{++} in dry season. But experimental data showed that there is no significant difference between two cultural practices with land tillage and nontillage. In fact, in many areas, when using proper cultural practices, nontillage soybean growing resulted in a seed yield of approximately 2-3 tons per ha.

In rice farmer field, growing soybean without land tillage means to seed or broadcast soybean seed right after rice harvest, when soil is still wet.

In floating rice area, soybean is directly seeded after rice harvest; then farmer does slightly tap on or use a long handled harrow to make soybean seed fall in wet soil surface. The remaining straw of floating rice is then served as a means of retaining soil moisture to meet water requirement of soybean for a long period of time. It was observed that when a crop of floating rice was successful, a crop of soybean followed was apparently successful, too.

In different rice fields, when soil was still wet, weeding was done after rice harvest and in better way, if there was much straw left, then the farmer made a so-called thin mat of straw stretched over the ground and burned it to kill pathogenic factors, weeds and also remaining straw. Besides, after burning, ash has an effect of neutralizing surface soil acidity and to provide some essential micro-elements to the plant. Afterwards, farmer digs small holes, put 2-3 soybean seeds in each hole, covers soybean seed with ash, and later stretches a mulch over the soybean field to maintain soil moisture.

In summary, in order to have good results from nontillage technique, we must pay attention to five main purposes following:

- Let's plant soybean when soil is still wet, not much dried out;
- After harvest, rice field must be free of weeds;
- In heavy soil, it is advisable to use a sharpened stick to dig a hole not large so that roots can easily develop well;
- After seeding, soybean seeds must be covered with ash or with ash mixed with different kinds of chemical fertilizers;
- In dry season, soil surface must be covered with a mulch, thick enough to retain soil moisture and also to prevent weeds.

Tran Thuong Tuan
Chu Huu Tin

3) Exotic soybean (*Glycine max* (L.) Merrill) observational yield performance trial in Kien Giang province - Mekong Delta - Vietnam - dry season 1981-1982

In the light of mutual technical assistance, six soybean varieties, namely 'Bon minori' (2 lines), 'Enrei' (2 lines), 'Akiyoshi' and 'Hyuuga', were forwarded by registered mail from Japan to Vietnam in May, 1981. Due to its long postal course, soybean seed was only received in November 1981. A month later, seeds were planted on December 10, 1981, at the provincial seed farm of Kien Giang province and then harvested on February 26, 1982.

Materials and methods. The intent of experiment is firstly to determine the adaptability to local environmental conditions of six soybean varieties from Japan, newly introduced in Kien Giang province in November, 1981; secondly, to introduce to local farmers some new high-yielding soybean varieties, which are also resistant to common disease and insect pests; and, thirdly, to recommend growing soybean, a cash crop, in rice farmer's field in order to uncover the prospect of intensive cultivation and/or multiple cropping and also to amend soil fertility which is not fertile, pH 5.5 $\pm$ 0.5 in the

quadrangle Long xuyen. Six soybean varieties with their respective entry number and number of seed planted were the following:

Name	Entry number	Number of seed planted
Enrei	040691	17
Akiyoshi	090125	34
Hyuuga	090204	29
Enrei	040697	15
Bon minori	040705	24
Bon minori	040207	17

Seeds were sown on the terrace recently built up in 1981 of Kien Giang provincial seed farm Service of Agriculture (20° 07' N), more or less representative of acid sulphate soil in the area. Seeding procedure was planting one seed per hill 2 cm deep, and spacings were 40 cm between rows, 10 cm between hills and 80 cm between varieties. The design was an observational yield performance trial without replicate; each variety was grown in a single row or in two subsequent rows, depending on number of seed in hand. Fertilizers were used with formula 40-80-30 kg/ha N, P_2O_5 and K_2O and nursery soil was disinfected with Basudin 10G at the rate of 30 kg/ha.

Results and discussion. Based on experimental data, the first fifteen days after seeding, all six soybean varieties tested had a satisfactory germination and a good initial plant vigor, thanks to some late rains and a favorable soil moisture. But days after days, surface soil dried out quickly, and irrigation was then practiced with water stored in surrounding ditches, the only source of irrigaton, more or less acid, which was apparently a limiting factor of plant vegetative growth. By the time, only Hyuuga continued to grow, while the other five soy varieties stopped growing and soon became stunted. In Hyuuga, plant height was 30 cm $\pm$ 0.5 and in others, plant height was approximately 15-20 cm.

In comparison of percent of field emergence and percent of surviving plants until harvest, in three varieties, Enrei (040691), Akiyoshi and Bon minori (040207), percent of surviving plant at harvest was very low, ranging from 10% to 21%, though their respective percent of field emergence seemed to be satisfactory. It was noticed that, partly, they were damaged by the common insects *Melanagromyza soja, Pseudoletia unipuncta* and *Cacoecia* sp.

In Hyuuga, Bon minori (040705) and Enrei (040697), their respective percent of surviving plant ranges from 47% to 64.5% (Table 1), the highest, but only Hyuuga gives a fair number of sound seed while the two other soybean varieties gave a lower number of seed and mostly seeds were small and wrinkled. Symptom of damage caused by *Maruca testutalis* was also noticed in Hyuuga soy variety.

At last, only Hyuuga soybean variety appeared to be the most promising one at this locality in dry season 1981-1981, but the observation above stated need to be understood with reserve. Consequently, this type of experiment should be repeated in coming rainy season 1982 for further study on the performance of these soybean varieties before reaching a definite significant reliable conclusion.

Table 1. Number of seed planted and percent of field emergence of six exotic soybean varieties tested in Kien Giang province - Mekong Delta - SR Vietnam, dry season 1981-1982.[a]

Variety name	Entry number	No. of seed planted	No. of seed germinated	No. of plants harvested	% of field emergence	% of surviving plants
Enrei	040691	19	15	2	78.9	10.5
Akiyoshi	090125	35	22	7	62.8	20.0
Hyuuga	090204	31	25	20	80.6	64.5
Enrei	040697	17	14	8	82.3	47.0
Bon minori	040705	26	20	14	76.9	53.8
Bon minori	040207	19	11	4	57.8	21.0

[a]Seeds compliments of Yasuo Ohta, D.Agr., D.Sc., professor, Tsukuba University in Japan.

Table 2. Agronomic characters of six soy varieties from Japan tested in provincial seed farm, Service of Agriculture, province of Kien Giang SR Vietnam - dry season 1981-1982

Entry number	Days to bloom	Days to maturity	Pubescence color	Flower color	Seed coat color	Hilum color	Seed size	No. of seed/ pod
040691	25	70-75	white	purple	yellow	brown	medium	1-2
090125	25	70-75	white	purple	yellow	brown	small	1-2
090204	25	70-75	yellow	purple	yellow	brown	medium	2-3
040697	25	70-75	white	purple	yellow	brown	medium	1-2
040705	30	75-85	yellow	white	yellow	black	small	1-2
040207	30	75-85	yellow	white	yellow	black	small	1-2

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